

What is claimed is:

[Claim 1] A chainwheel assembly including a plurality of chainwheels engageable with a chain having successive alternating pairs of inner link plates and outer link plates connected by pins, the pins surrounded by rollers, the chainwheel assembly comprising: at least one smaller chainwheel having a plurality of teeth spaced about its circumference; and at least one larger chainwheel having a greater number of teeth spaced about its circumference than the smaller chainwheel, the larger chainwheel and the smaller chainwheel oriented relative to each other such that a distance between a center of the chain roller positioned between a pair of adjacent teeth on the larger chainwheel and the center of the chain roller between a pair adjacent teeth on the smaller chainwheel is substantially an integer multiple of the chain pitch, at least a first tooth of the pair of adjacent teeth on the larger chainwheel including a lateral recess disposed on a front face of the larger chainwheel facing the smaller chainwheel to allow the chain to move from the smaller sprocket towards the larger chainwheel, at least a second tooth of the pair of adjacent teeth disposed adjacent to the first tooth opposite the drive rotation direction having a configuration to prevent the second tooth from capturing the chain.

[Claim 2] The chainwheel assembly of claim 1 wherein the recess is configured to include a run-on ramp for lifting the chain, the run-on ramp extending to a tooth root of the second tooth.

[Claim 3] The chainwheel assembly of claim 2 wherein the run-on ramp extends, at the tooth root, into the outer periphery of the larger chainwheel.

[Claim 4] The chainwheel assembly of claim 1 wherein the second tooth includes a recess for lifting the chain.

[Claim 5] The chainwheel assembly of claim 4 wherein the larger sprocket includes a third tooth disposed adjacent the second tooth opposite the drive rotation direction includes a run-out chamfer disposed on the front face of the larger chainwheel, the run-out chamfer extending obliquely backward

opposite to the drive rotation direction to provide a shifting lane for the link plate.

[Claim 6] The chainwheel assembly of claim 4 wherein the two recesses are combined into one recess extending over the first tooth and the second tooth.

[Claim 7] The chainwheel assembly of claim 1 wherein the recess has a depth approximately equal to a thickness of the link plate.

[Claim 8] The chainwheel assembly of claim 1 wherein the second tooth includes a deflection chamfer directed toward the smaller chainwheel to prevent the second tooth from capturing the chain.

[Claim 9] The chainwheel assembly of claim 8 wherein the deflection chamfer is pronounced on an edge of the second tooth pointing in the drive rotation direction and tapers off toward a back of the tooth on an opposite edge of the second tooth.

[Claim 10] The chainwheel assembly of claim 8 wherein the second tooth includes a run-out chamfer disposed one of next to and under the deflection chamfer on an edge of the second tooth directed toward a third tooth disposed adjacent to the second tooth opposite drive rotation direction, the run-out chamfer configured to provide a shifting lane for the inner link plate and facilitate an upward lifting of the inner link plate at the end of the shifting operation.

[Claim 11] The chainwheel assembly of claim 10 wherein the run-out chamfer begins at the tooth root of the second tooth on the front face and tapers off at one of a tooth back and the deflection chamfer.

[Claim 12] The chainwheel assembly of claim 1 wherein the first tooth and the second tooth each include a deflection chamfer directed toward the smaller chainwheel to prevent the first tooth and the second tooth from capturing the chain.

[Claim 13] The chainwheel assembly of claim 10 wherein the deflection chamfer is pronounced on an edge of the respective tooth pointing in the drive rotation direction and tapers off toward a back of the tooth on an opposite edge of the tooth.

[Claim 14] The chainwheel assembly of claim 1 wherein the larger sprocket includes a third tooth disposed adjacent the second tooth opposite the drive rotation direction is configured to capture the chain, the third tooth having a chamfer extending to the tooth root on a back face of the larger chainwheel facing a next larger chainwheel.

[Claim 15] The chainwheel assembly of claim 1 wherein tooth backs of the first tooth and the second tooth are located directly on a back face of the larger chainwheel facing the next larger chainwheel such that at an end of the shifting operation, the inner link plate has traveled a maximum axial shifting distance before it slides over the tooth back before the chain capture tooth.

[Claim 16] The chainwheel assembly of claim 1 wherein the first, second and third second teeth comprise tips that are chamfered on the front face such that at the end of the shifting operation, the inner link plate does not abruptly jump over the tooth back of the respective tooth.

[Claim 17] A chain engageable with a chainwheel assembly including a plurality of chainwheels having a varying tooth counts, the chain comprising: a plurality of inner links having inner link plates; a plurality of outer links having outer link plates; a plurality of tubular pins joining the outer and inner links in alternating sequence; the inner link plate having an outer chamfer disposed on an outer surface of the inner link plate, the outer chamfer disposed on a central region of the inner link extending between two points where a first end of the inner link plate having a convex outer contour transitions into the central region of the inner link plate having a concave outer contour and where the central region transitions into a second end of the inner link plate having a convex outer contour.

[Claim 18] The chain of claim 17 wherein the chamfer includes, in the central region of the inner link plate, an approximately straight line chamfer profile of the transition line that is defined by the chamfer surface and the remaining unchamfered outer side surface of the inner link plate.

[Claim 19] The chain of claim 17 wherein the inner link plate includes an inner chamfer on an inner surface of the inner link plate, the inner and outer

chamfers form, in the central region of the inner link plate, a combined edge that is substantially closer to the inner surface than to the outer surface.

[Claim 20] The chain of claim 19 wherein the inner and outer chamfers are rounded and disposed on longitudinal sides of the inner link plate.

[Claim 21] The chain of claim 17 wherein the inner link plate includes an inner chamfer disposed on an inner surface, the inner and outer chamfers form, in a central region of the inner link plate, rounded edges.

[Claim 22] The chain of claim 17 wherein the chain engages a chainwheel assembly having at least one smaller chainwheel and at least one larger chainwheel having a first tooth including a recess configured to include a run-on ramp and a second tooth disposed adjacent the first tooth opposite the drive rotation direction having a run-out chamfer and one of a recess having a run-on ramp and deflection chamfer.

[Claim 23] The chain of claim 22 wherein the run-on ramp extends beyond the root of the tooth into an edge of the second tooth.